

# Citizen Research on American Eels: Review of Progress, Future Directions



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NYS Department of Environmental Conservation



## Questions for today

Are the current protocols and future plans appropriate?

How can this project be more effective and useful for scientists and managers?

How can this project be more effective and useful to participants and students?

What should we be asking the data?



Sarah Mount & Bob Schmidt



# American Eel (*Anguilla rostrata*)



- Catadromous
- Widespread range along East and Gulf Coast watersheds
- Slow to mature (10+ years)
- Elvers commercially harvested in some states
- Declines noted in both American and European anguillids



# Study design and materials



**Eel and Herring Research Project at Fall Kill, Poughkeepsie**

Date: \_\_\_\_\_ Time of Sampling: \_\_\_\_\_ Time of Low Tide (from table): \_\_\_\_\_  
 Names of Samplers: \_\_\_\_\_ School/Group: \_\_\_\_\_

**ENVIRONMENTAL DATA**

Air Temp: \_\_\_\_\_°F \_\_\_\_\_°C Water Temp: \_\_\_\_\_°F \_\_\_\_\_°C  
 Stream Flow Direction (circle one): upstream downstream slack  
 Tide Period in Hudson River (refer to table and circle one): high low ebb flood

Cloud Cover (check one) Precipitation (check one)  
 Clear (0-10%)  None  
 Partly cloudy (10-50%)  Drizzle  
 Partly to mostly cloudy (50-90%)  Light Rain  
 Overcast (>90%)  Heavy Rain  
 Foggy  Squally (rainy with gusts of wind)  
 Hazy  Snow or Sleet

**GLASS EEELS**

Glass eels refers only to those small eels that are partly transparent. You may also catch small brown or yellow eels that have been in the stream for a year or two. Remember to close the net when done!

Number of glass eels caught: \_\_\_\_\_ Number weighed: \_\_\_\_\_ Total Weight: \_\_\_\_\_ grams  
 Other animals caught in the net, including small yellow and brown eels (record number and species): \_\_\_\_\_

**HERRING**

Choose a spot not interrupted by the eel net and watch for herring for 15 minutes. Polarized glasses will help. Herring are usually about a foot long, are swimming upstream, and have a blue/gray color.

Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_  
 First observer, number of herring: \_\_\_\_\_ Second observer, number of herring: \_\_\_\_\_

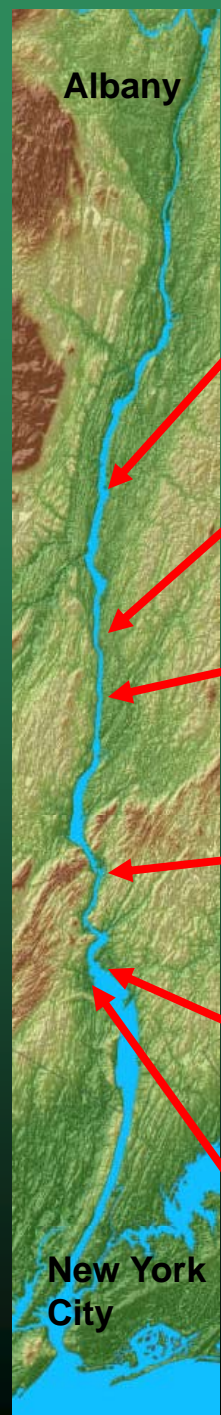
**OTHER NOTES AND OBSERVATIONS** (including fishermen, animals, and things you see): \_\_\_\_\_

Contacts: Chris Bowser (NYSDEC Estuary Program): cell (845)264-5041; Lisa DiMarzio (Wild Hudson Children's Museum): (845)471-0589  
 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION HUDSON RIVER ESTUARY PROGRAM

**Straightforward methodology consistent across sites:**  
 Catch in fyke nets placed at trib mouths; Count, weigh, and release upstream;  
 Record environmental conditions; March through May season



# Similar methods, varied participants



Saw Kill: college and faculty

Crum Elbow: alternative high school

Fall Kill: high school students, interns

Indian Brook: nature center, visitors

Furnace Brook: high school students

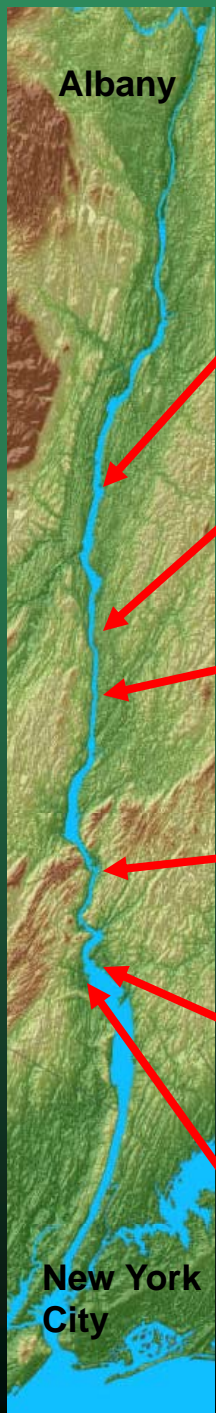
Minisceongo Creek: watershed citizens group



Furnace Brook



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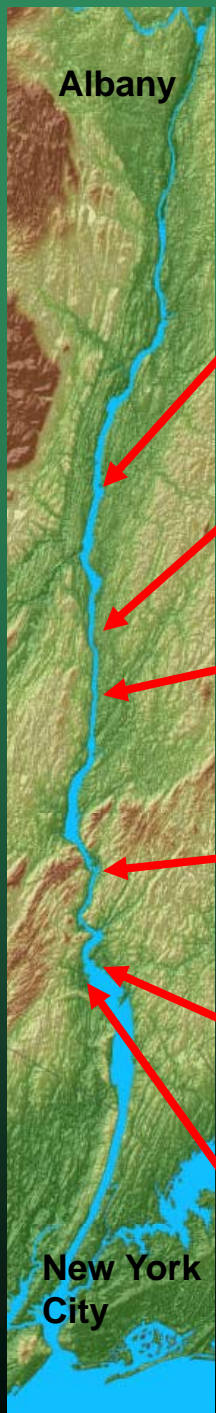
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Fall Kill



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# New sites for 2010



Albany

**Hannacroix Creek**

Saw Kill: college and faculty

**Black Creek**

Crum Elbow: alternative high school

Fall Kill: high school students, interns

Indian Brook: nature center, visitors

Furnace Brook: high school students

Minisceongo Creek: watershed citizens group

**Saw Mill Creek**

New York City



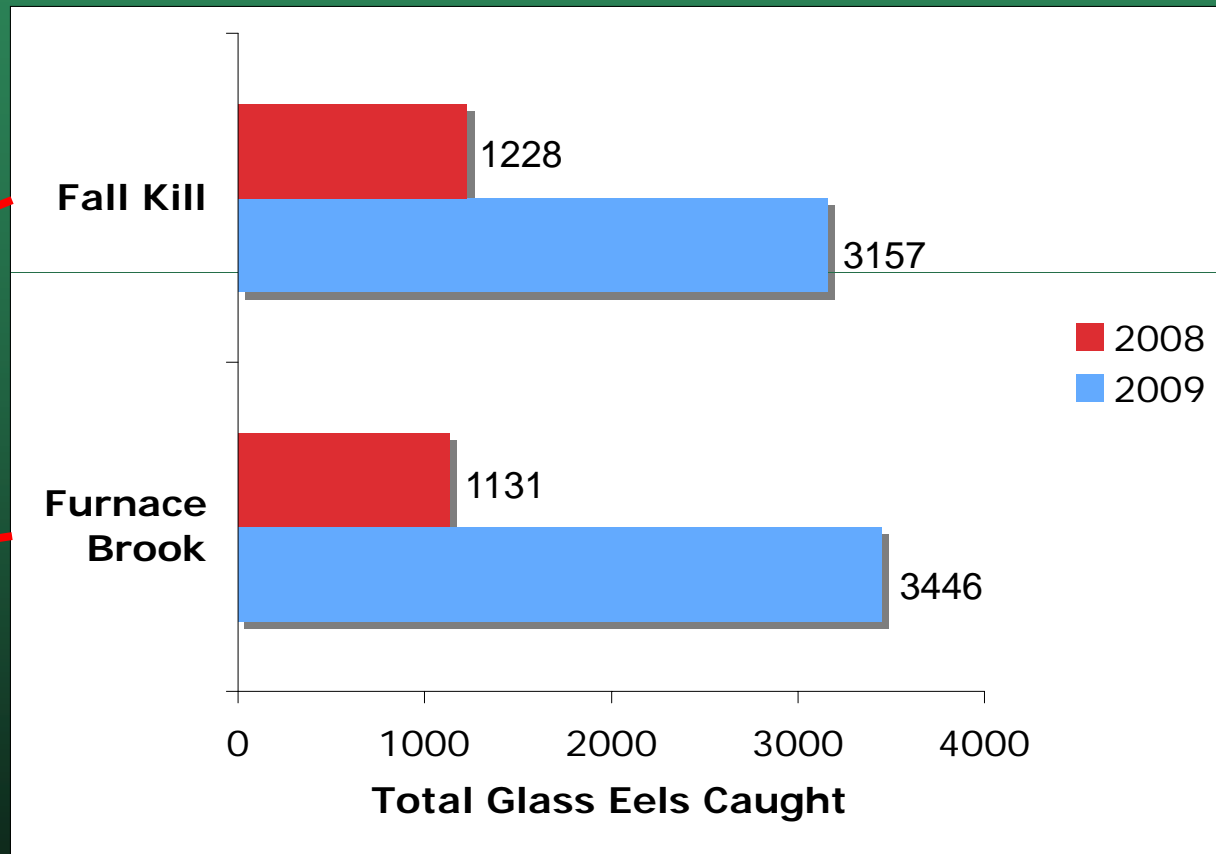
Minisceongo Creek





## Examples of Results from 2008 & 2009

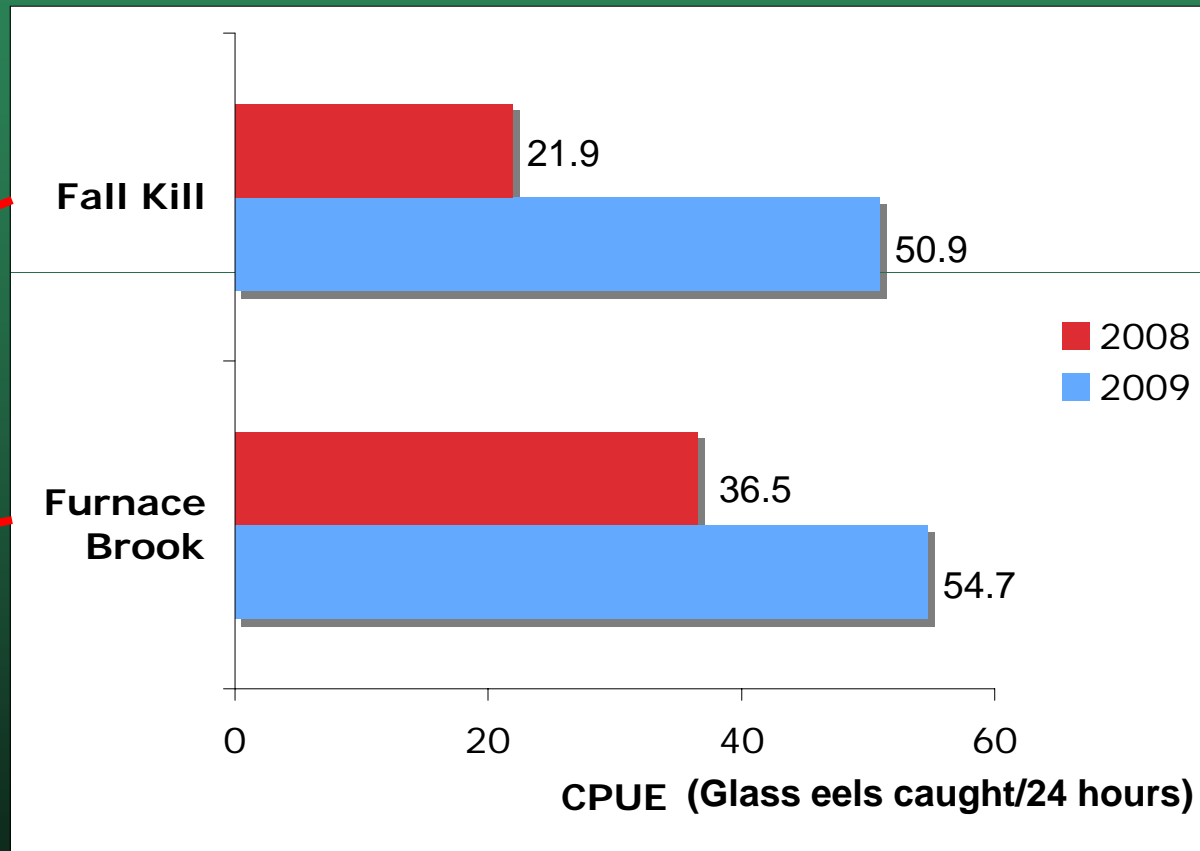
- Glass eel totals higher in downriver site
- 2009 migration was stronger than 2008 at our study sites.

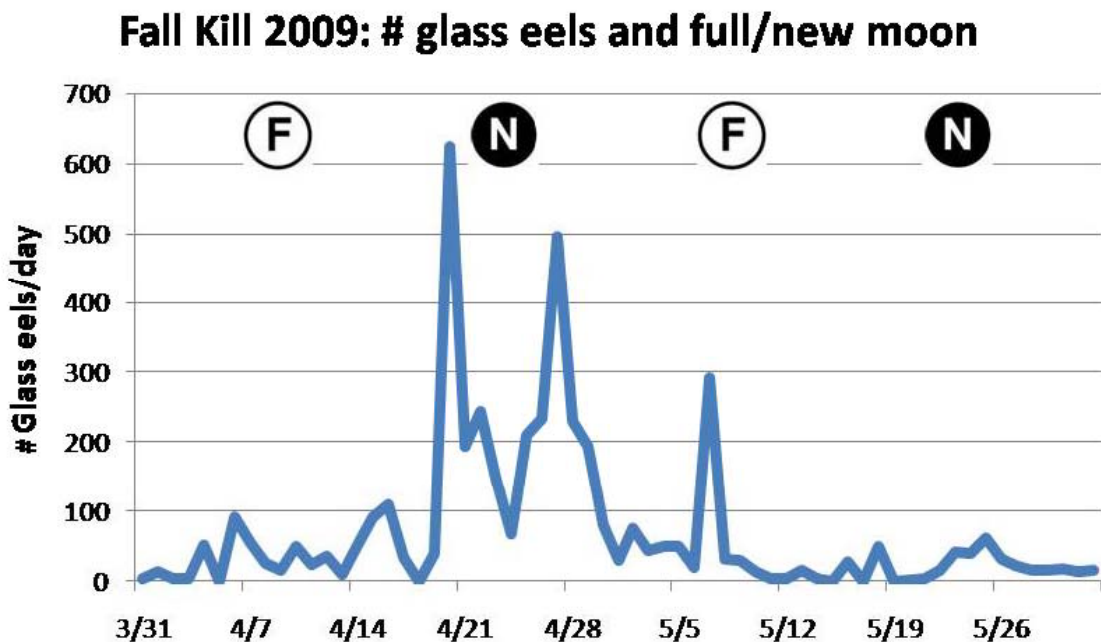
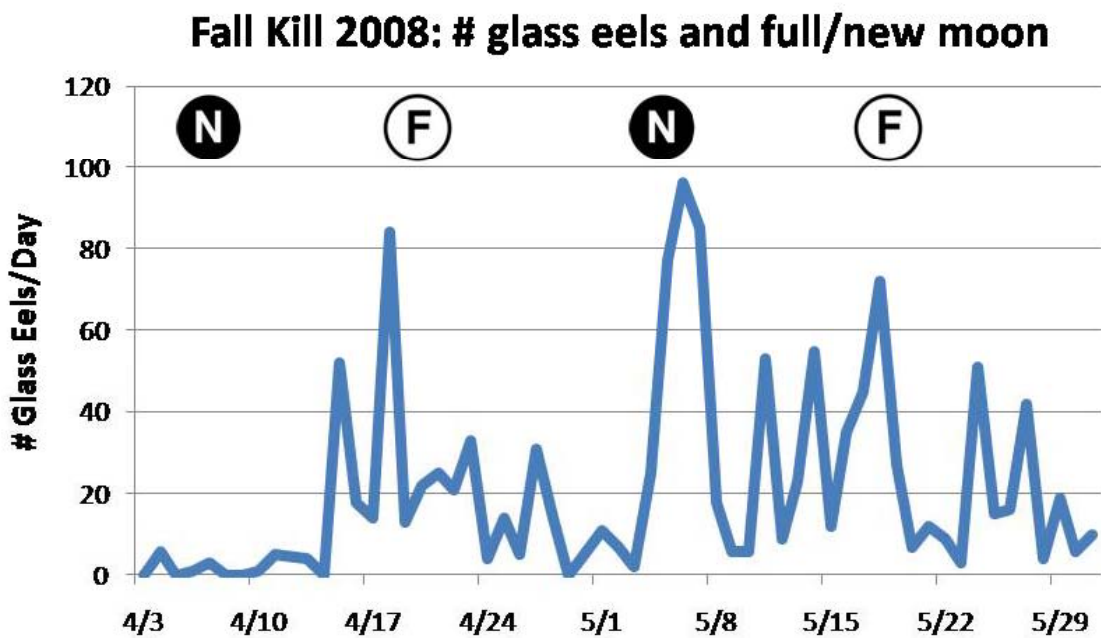




# Examples of Results from 2008 & 2009

- Glass eel CPUE is higher in downriver site
- 2009 migration was stronger than 2008 at our study sites.

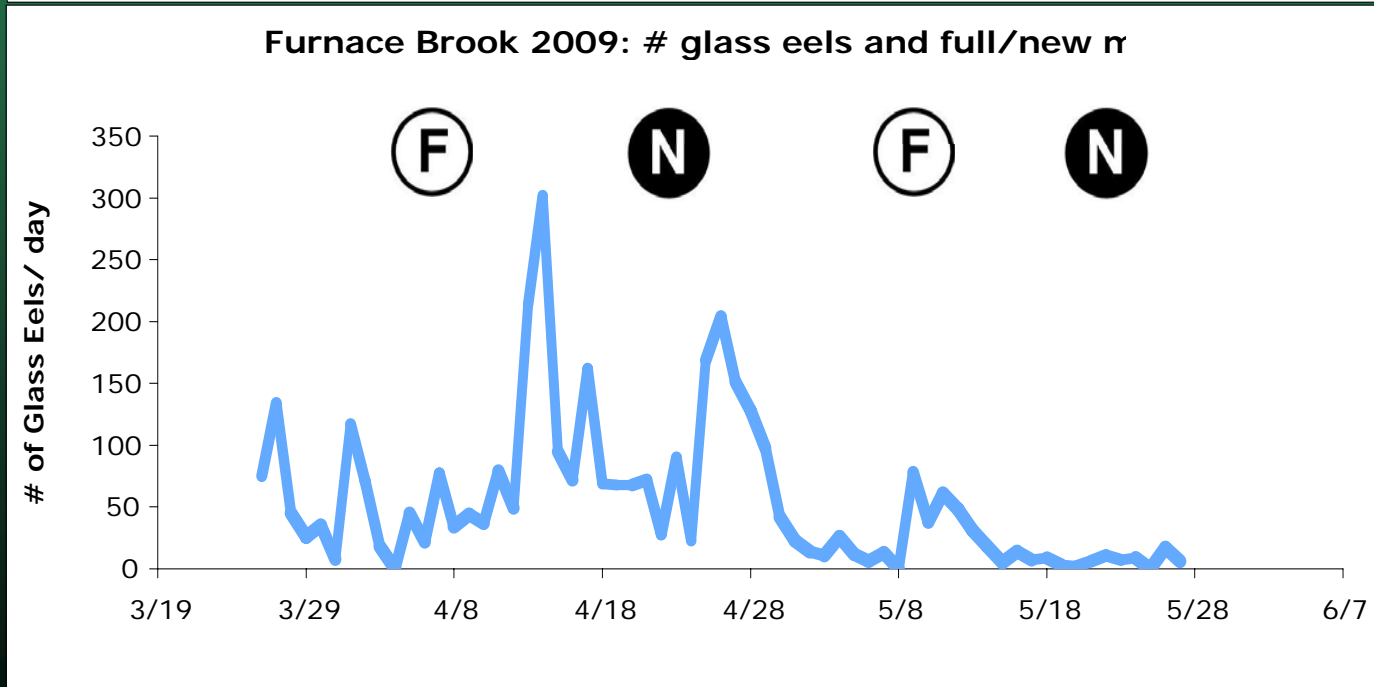
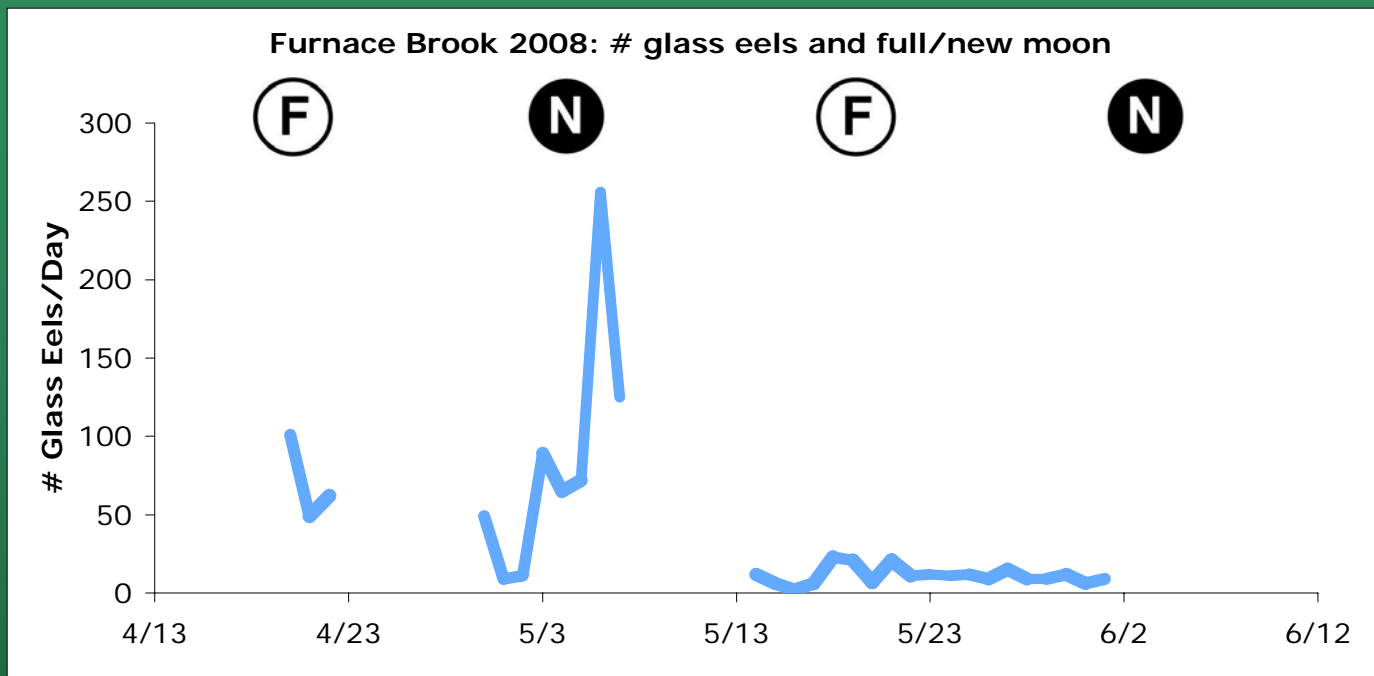




## Examples of Results from 2008 & 2009

- 2009 migration was stronger than 2008 at our study sites.
- Correlation with lunar phase and high water level?





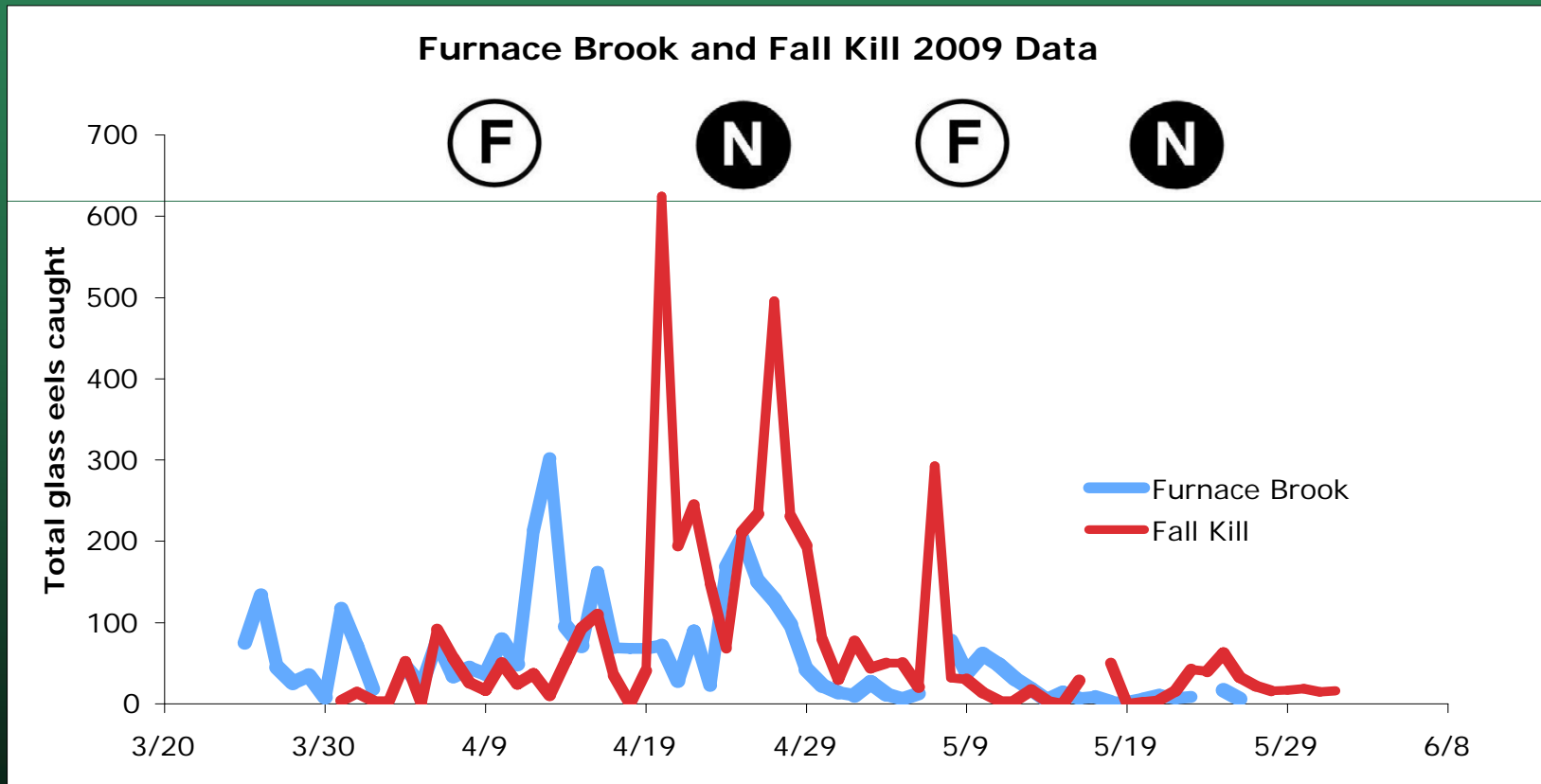
## Examples of Results from 2008 & 2009

correlation with lunar phase and high water level?



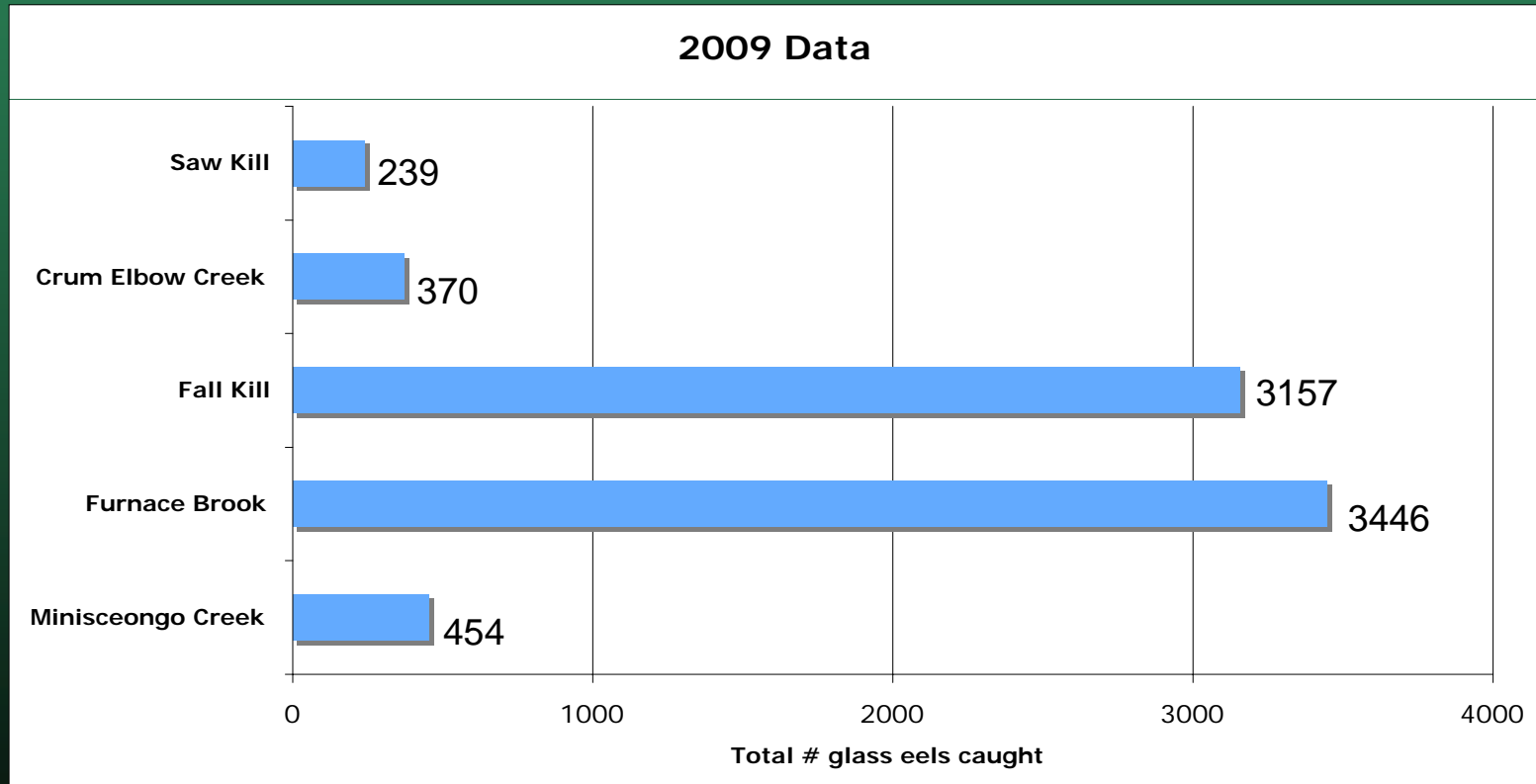
# 2009 Results

Beginning of migration may start earlier at downriver sites



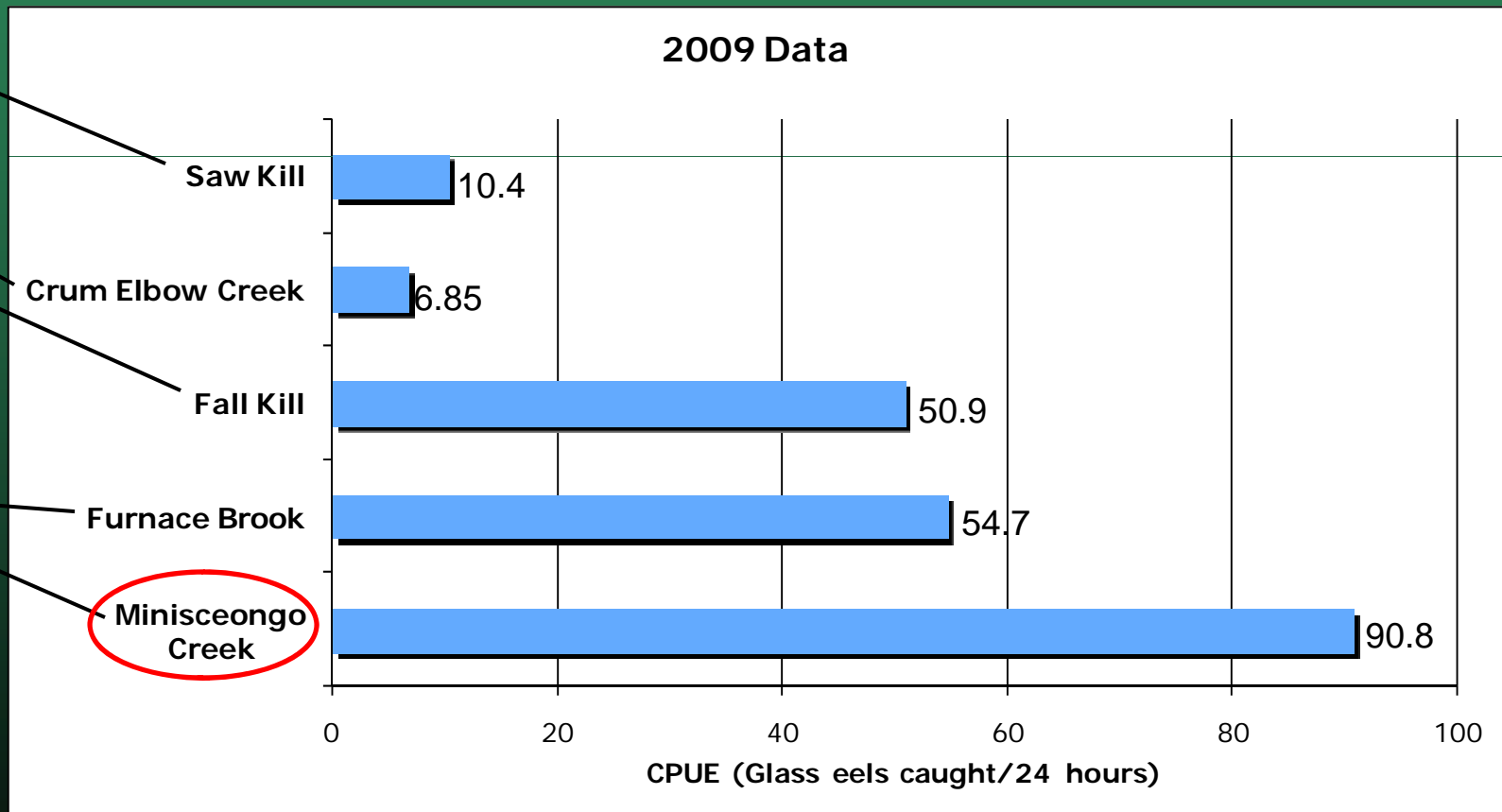
# 2009 Results

More total eels caught at sites with most volunteer support and longest sampling periods



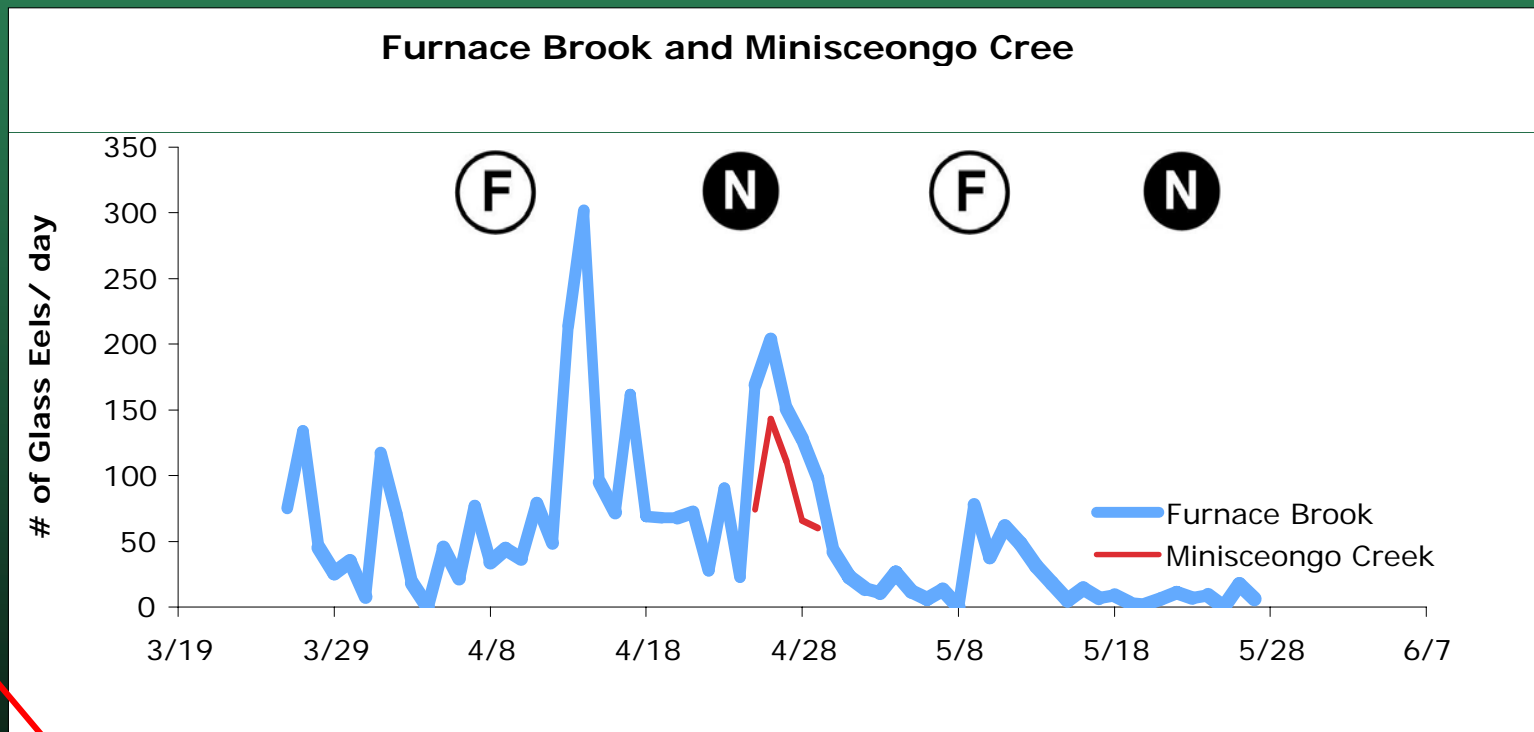
# 2009 Results

Possible geographic influence on glass eel stream choice, but CPUE also skewed depending on sampling period



# 2009 Results

Similar patterns in eel migration at sites directly across from each other



Furnace Brook

Minisceongo Creek



# Discussion Topics

- Adhering to ASMFC YOY procedures and DEC regs with volunteers and students
- Best methods of reporting and outreach
- This project is part of larger focus on eel populations and habitat access



# ASMFC YOY Survey Procedures

## REQUIRED

- Fyke nets or elver traps
- Check at least 4 days per week
- Catch and CPUE (".25 hours"?)
- Eels should be released above 1<sup>st</sup> barrier
- "measurements of water level and discharge, as appropriate for sampling site."

## RECOMMENDED

- Length, weight, and pigmentation of 60 elvers collected twice weekly
- Check daily



# Extension topics

- Eel passage project
- Focus on watershed and benthic habitats
- Mitten Crab research
- Expanded college involvement



# Education

- Public outreach and presentations
- Family and friends
- Research close to home



# Post Project Evaluations from 2009

(numbers are averages for approx. 30 evaluations)

“Please rate your **knowledge** of your local stream environment before and after this project”

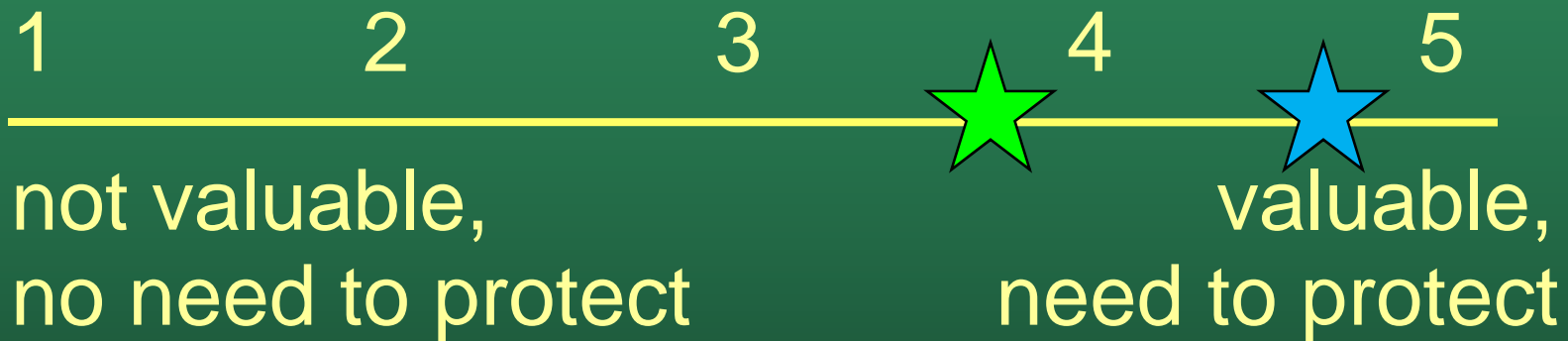


**Before: 2.2**

**After: 3.8**



“Please rate your **attitude** of your local stream environment before and after this project”



**Before: 3.8**

**After: 4.7**



# What did you like most about the project?

“I enjoyed the nasty sliminess of the eels and getting dirty.”

“Working with both college and highschool students.”

“I liked getting to count the eels, and feel them moving around in my hand.”





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# Challenges and Opportunities



## Of Citizen Science



- Generating volunteer interest despite few finds
- Questionable data quality
- Volunteers inexperienced at larval species identification
- Use of untested or undependable methods
- Volunteers want **worthwhile** research experience
- Couple low return project with high return project
- Collect simple parameters (ID, size, sex)
- Study charismatic species at life stages that are easy to identify
- Built-in lessons on troubleshooting and scientific uncertainty
- Connect research to the “big picture” and allow volunteer input



## Further reading

- Schweid, Richard. *Consider the Eel*. 2002. University of North Carolina Press, Chapel Hill, NC.
- Schmidt, R., Lake, T., and R. Peterson. Hudson River tributaries in the lives of fishes with emphasis on the American eel. 2006. *In American Fisheries Society Symposium* 51:317-330.

## Acknowledgments

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# Special Thanks

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- Dutchess BOCES Environmental Academy
- Mirant Bowline
- Audubon at Constitution Marsh
- Hudson River Sloop Clearwater



# Thank you



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